

Int'l Appl. No. : PCT/EP2004/010926
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AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method for separating particles in a fluid according to size comprising the steps of

a) transporting ~~a~~the fluid ~~containing~~comprising said particles across a profiled surface ~~carrying~~comprising at least two adjacent regions of different depth which form a surface level step, wherein

- the fluid is transported by mechanically moving a flat first surface across the profiled surface,

- the adjacent regions of different depth are arranged such that the depth of the regions decreases in the net direction of a forward displacement of the first surface,

- the depth of the regions is between 2 and 200 micrometers,

- force is applied such that one surface is pushed towards the other surface, and

b) ~~allowing the separation of~~separating said particles by means of the backflow of excluded particles, said backflow generated by moving said first surface past said profiled surface.

2. (Currently amended) ~~A~~The method according to claim 1, wherein where the first surface overlaps with the profiled surface, the first surface lies flat and parallel to ~~the~~ portions of the profiled surface without regions of different depth.

3. (Currently amended) ~~A~~The method according to ~~claims 1 and 2~~claim 1, wherein where the first surface overlaps with the profiled surface, ~~at least~~ the region(s) of different depth overlap with the first surface.

4. (Currently amended) ~~A~~The method according to ~~any of claims 1 to 3~~claim 1, further comprising the step of collecting the particles from one or more adjacent regions of different depth.

5. (Currently amended) ~~A~~The method according to ~~any of claims 1 to 4~~claim 1, wherein the widths of two or more regions adjacent to the surface level step are different.

6. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 5~~claim 1, wherein the regions of different depth are micro machined.

7. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 6~~claim 1, wherein the first surface moves in an intermittent mode.

8. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 7~~claim 1, wherein the first surface moves alternately forwards and backwards, each movement having a duration and a velocity selected such that the net displacement is in the forward direction.

9. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 8~~claim 1, wherein each of one or more of said regions of different depth ~~regions~~ ~~each~~ comprise an opening into a chamber.

10. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 9~~claim 1, wherein said particles are non-covalently bound to said first surface before they reach said surface level step.

11. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 10~~claim 1, wherein a selective force field is applied to selectively and temporarily direct at least one fraction of the particles towards a predetermined surface during a given period.

12. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 11~~claim 1, wherein a side-outlet channel is provided near at least one side of said surface level step.

13. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 12~~claim 1, wherein the particles are collected after the separation by applying a second flow parallel to said surface level step.

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14. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 13~~ claim 1, wherein said fluid substances are continuously fed at a channel inlet and are continuously withdrawn from one or more outlet channels.

15. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 14~~ claim 12, further comprising, the step of collecting particles at said outlet channel(s).

16. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 15~~ claim 1, wherein the direction of said surface level step and ~~the a~~ mean direction of the flow cross at an angle between 1° and 90°.

17. (Currently amended) ~~A-The~~ method according to ~~any of claims 1 to 16~~ claim 14, wherein said fluid substances are fed at a limited section of the channel inlet only.

18. (Currently amended) A device for separating particles in a fluid according to size comprising:

- a profiled surface carrying comprising at least two adjacent regions of different depth which form a surface level step, in which the depth of the regions is between 2 and 200 micrometers,

- a flat first surface that is capable of mechanically moving across the profiled surface, and

- a means for mechanically moving said first surface over the profiled surface, wherein the adjacent regions of different depth are arranged such that the depth of the surface level steps decreases in the net direction of the forward displacement of the first surface.

19. (Currently amended) ~~A-The~~ device according to claim 18 wherein where the first surface overlaps with the profiled surface, the first surface lies substantially flat and parallel to the portions of the profiled surface without regions of different depth.

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20. (Currently amended) A-The device according to ~~claims 18 and 19~~claim 18, wherein at least the region(s) of different depth of the profiled surface overlap with the first surface.

21. (Currently amended) A-The device according to ~~any of claims 18 to 20~~claim 18, further comprising a means to apply a pressure to at least one surface.

22. (Currently amended) A-The device according to ~~any of claims 18 to 21~~claim 18, wherein the widths of two or more regions of different depth adjacent to the surface level step are different.

23. (Currently amended) A-The device according to ~~any of claims 18 to 22~~claim 18, wherein the regions of different depth are micro-machined.

24. (Currently amended) A-The device according to ~~any of claims 18 to 23~~claim 18, wherein the first surface is capable of moving in an intermittent mode.

25. (Currently amended) A-The device according to ~~any of claims 18 to 24~~claim 18, wherein the first surface is capable of moving alternately forwards and backwards, each movement having a duration and a velocity selected such that the net displacement is in the forward direction.

26. (Currently amended) A-The device according to ~~any of claims 18 to 25~~claim 18, wherein each of one or more of said regions of different depth ~~regions~~ each comprise an opening into a chamber.

27. (Currently amended) A-The device according to ~~any of claims 18 to 26~~claim 18, wherein a side-outlet channel is provided near at least one side of said surface level step.

28. (Currently amended) A-The device according to ~~any of claims 18 to 27~~claim 18, further comprising a means to apply a second flow parallel to said surface level step.

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29. (Currently amended) ~~A-The~~ device according to ~~any of claims 18 to 28~~claim 18, further comprising an inlet channel and one or more outlet channels.

30. (Currently amended) ~~A-The~~ device according to ~~any of claims 18 to 29~~claim 29, further comprising means to continuously feed said fluid to the channel inlet, and withdraw a fluid from one or more outlet channels.

31. (Currently amended) ~~A-The~~ device according to ~~any of claims 19 to 30~~claim 19, wherein the direction of said surface level step and ~~the-a~~ mean direction of the forward displacement of the first surface cross at an angle between 1° and 90°.

32. (Currently amended) ~~A-The~~ device according to ~~any of claims 19 to 31~~claim 19, wherein the movement of the first surface past the profiled surface generates at least one recirculating flow.

33. (Currently amended) ~~Use of a device according to claims 19 and 32~~A method for size-separating particles in a fluid comprising:

-transporting the fluid comprising said particles across the profiled surface of the device of claim 19; and

separating said particles by means of a backflow generated by moving said flat first surface past said profiled surface.